

CLAIMS

1. An opto-electrical device comprising:

an anode electrode;

a cathode electrode; and

an opto-electrically active region located between the electrodes;

the cathode electrode including:

a first layer comprising a material having a work function below 3.5 eV;

a second layer of a different composition from the first layer, comprising another material having a work function below 3.5 eV, the second layer being further from the opto-electrically active region than the first layer; and

a third layer comprising a material having a work function above 3.5 eV, the third layer being further from the opto-electrically active region than the first layer.

2. An opto-electrical device as claimed in claim 1, wherein one of the first and second layers comprises a compound of a group 1 or group 2 or transition metal.

3. An opto-electrical device as claimed in claim 2, wherein the compound is a halide.

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~~4. An opto-electrical device as claimed in any preceding claim, wherein the compound is a fluoride.~~

~~5. An opto-electrical device as claimed in any of claims 2 to 4, wherein the metal is a group 1 or 2 metal.~~

6. An opto-electrical device as claimed in claim 5, wherein the metal is lithium.

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~~7. An opto-electrical device as claimed in any of claims 2 to 6, wherein the said one of the layers is the first layer.~~

8. An opto-electrical device as claimed in any of claims 2 to 6, wherein the said one of the layers is the second layer.
9. An opto-electrical device as claimed in any of claims 2 to 8, wherein the other of the first and second layers comprises a metal.
10. An opto-electrical device as claimed in claim 9, wherein the other of the first and second layers comprises a metal selected from the group comprising: Li, Ba, Mg, Ca, Ce, Cs, Eu, Rb, K, Y, Sm, Na, Sr, Tb or Yb.
11. An opto-electrical device as claimed in any preceding claim, wherein the second layer is thicker than the first layer.
12. An opto-electrical device as claimed in any preceding claim, wherein the thickness of the second layer is greater than 100 Å.
13. An opto-electrical device as claimed in any preceding claim, wherein the said material having a work function below 3.5 eV of which the first layer is comprised has a higher work function than the said material having a work function below 3.5 eV of which the second layer is comprised.
14. An opto-electrical device as claimed in any preceding claim, wherein the thickness of the third layer is greater than 1000 Å.
15. An opto-electrical device as claimed in any preceding claim, wherein the said material having a work function above 3.5 eV has an electrical conductivity greater than $10^5 (\Omega \cdot \text{cm})^{-1}$.
16. An opto-electrical device as claimed in any preceding claim, wherein the said material having a work function above 3.5 eV is aluminium, gold or indium-tin oxide

17

17. An opto-electrical device as claimed in any preceding claim, wherein the cathode is transparent.

18. An opto-electrical device as claimed in any preceding claim, wherein the opto-electrically active region is light-emissive.

19. An opto-electrical device as claimed in any preceding claim, wherein the opto-electrically active region comprises a light-emissive organic material.

20. An opto-electrical device as claimed in claim 19, wherein the light-emissive organic material is a polymer material.

21. An opto-electrical device as claimed in claim 20, wherein the light-emissive organic material is a conjugated polymer material.

22. An opto-electrical device as claimed in any of claims 19 to 21, comprising a charge transport layer between the light-emissive organic material and one of the electrodes.

23. A method for forming an opto-electrical device, the method comprising:

depositing an anode electrode;

depositing over the anode electrode a region of an opto-electrically active material;

depositing over the region of opto-electrically active material a material having a work function below 3.5 eV to form a first cathode layer;

depositing over the first cathode layer another material having a work function below 3.5 eV to form a second cathode layer of a different composition from the first cathode layer; and

depositing over the second cathode layer a material having a work function above 3.5 eV to form a third cathode layer.

24. An opto-electrical device substantially as herein described with reference to figures 2 to 9 of the accompanying drawings. *A*

25. A method for forming an opto-electrical device substantially as herein described with reference to figures 2 to 9 of the accompanying drawings.

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